

REMARKS

Applicant thanks the Examiner for withdrawing the rejections which Applicant had appealed and indicating that Applicant's position was persuasive. For clarity of the record, Applicant notes that the Examiner has not filed an answer to the Appeal Brief filed November 1, 2006, but has instead issued an office action reopening prosecution on the merits with new and different grounds of rejection.

The only rejection in the present application is of pending claims 50-62 as obvious under 35 U.S.C. § 103(a) based upon U.S. Patent No. 5,335,611 to Paine in view of U.S. Patent No. 3,608,621 to Bollig et al. The seminal case directed to application of 35 U.S.C. § 103 is *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). From this case, four familiar factual inquiries have resulted. The first three are directed to the evaluation of prior art relative to the claims at issue, and the last is directed to evaluating evidence of secondary considerations. See, MPEP §2141. The Federal circuit has recently reaffirmed that *Graham* "continue[s] to define the inquiry that controls." *KSR v. Teleflex*, 550 U.S. ___, No. 04-1350, page 2 (April 30, 2007).

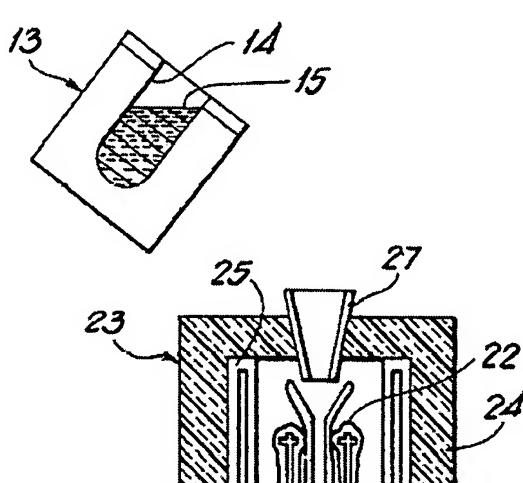
The examiner bears the burden of establishing a *prima facie* case of obviousness. See, *In re Warner*, 379 F.2d 1011, 1016, 154 USPQ 173 (CCPA 1967), *cert. denied*, 389 U.S. 1057 (1968). To meet this burden, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion

to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. See, MPEP § 2142, *citing In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). For the following reasons, these criteria have not been met and a *prima facie* case of obviousness has not been established.

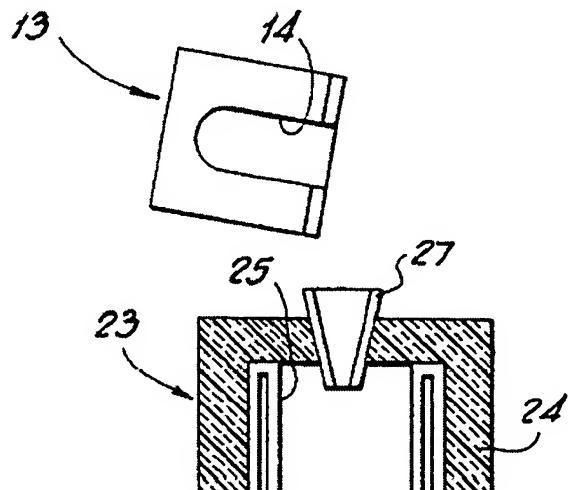
If a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. See, MPEP 2143.01, *citing In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). *In re Ratti* reversed the rejection of claims directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. The court reversed the rejection "since the suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." *In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959), cited by MPEP 2143.01.

The examiner's rejection suffers from the same deficiency as the rejection in *In re Ratti*. The rejection proposes modifying the Paine reference by combining it with the upstanding tube structures of Bollig et al. This modification would require a fundamental reconstruction and redesign of the Paine reference and would change Paine's basic principle of operation.

Paine discloses a system that pours molten metal using a tilt pour crucible: “[c]ontained in the chamber 11 is a coil box assembly 13 having induction heating coils (not shown) and crucible 14; the assembly 13 being mounted such that it may be tilted to pour the molten metal 15 in known manner.” See, Paine, column 5, lines 20-24 (underlining added); also see column 6, lines 64-66 (“Operation of the apparatus [of Figs. 3 and 4] is essentially similar to that described with reference to FIGS. 1 and 2.”). This principle of operation is illustrated in the following portions of Figs. 1 and 2 of Paine:



Portion of Fig. 1 of Paine



Portion of Fig. 2 of Paine

Assuming *arguendo* that the asserted combination would even be operative, it would require a substantial redesign of Paine’s crucible that would change its basic tilt-pour principle of operation. There are further reasons that support patentability.

It is well established that, “an applicant may rebut a *prima facie* case of obviousness by showing that the prior art teaches away from the claimed invention in any material respect.” *In re Peterson*, 315 F.3d 1325, 1331, 65 USPQ2d 1379 (Fed.

Cir. 2003). Furthermore, if a proposed modification renders a reference being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. See, MPEP 2143.01, *citing In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

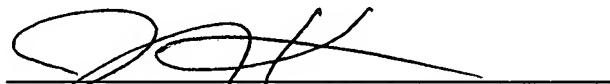
As stated above, the proposed combination is to add the upstanding tube structures of Bollig et al. to Paine. Bollig et al. teaches that the proposed combination would render Paine unsatisfactory for its intended purpose of metal casting in a vacuum chamber. Bollig et al. teaches that using a vacuum in connection with its apparatus is disadvantageous for numerous reasons. See, Bollig et al. column 1, lines 9-18. Furthermore, Bollig et al. teaches instead of using a vacuum, one should bubble gas up through the molten metal to raise its level. See, Bollig et al. column 1, lines 32-37. This mode of operation is incompatible with use of a vacuum chamber as taught by Paine. Bollig et al. highlights this incompatibility by noting the difficulty of controlling the vacuum level. See, Bollig et al. column 1, lines 17-18. This difficulty is exacerbated by the gas bubbling technique taught by Bollig et al. For at least these reasons, Bollig et al. teaches away from the proposed combination. There are additional reasons that support patentability.

As stated above, a *prima facie* case of obviousness requires that a proposed combination of references teach or suggest every claim limitation. The proposed combination fails to teach or suggest every element of at least independent claim 50. independent claim 50 recites “overfilling the cavity so that liquid state metal flows into and fills the inner tube.” The proposed combination does not teach or suggest this limitation. As the Examiner acknowledges, Paine lacks any disclosure of an inner tube

or a cavity, and merely discloses a tilt-pour crucible. Nor does Bollig et al. teach or suggest this limitation. To the contrary, in Bollig et al., the flow of metal is accomplished by bubbling gas through the molten metal to cause it to rise. See, Bollig et al. column 2, lines 24-28. This is yet another reasons that no *prima facie* case of obviousness has been established.

For at least the foregoing reasons, reconsideration of the present application and timely allowance and issuance are respectfully requested.

Respectfully Submitted,



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